

Application. No. 09/977,137
Amendment dated September 16, 2003
Reply to Office Action of June 17, 2003

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A non-naturally occurring recombinant DNA molecule comprising a nucleotide sequence encoding a chelon protein which binds mercuric and cadmium ions, wherein the chelon protein comprises an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10, amino acids 1 to 107 of SEQ ID NO:11, and amino acids 1 to 107 of SEQ ID NO:12.
2. (Currently amended) The non-naturally occurring recombinant DNA molecule of claim 1 wherein the nucleotide sequence encodes a chelon protein having the amino acid sequence given in amino acids 1 to 107 of SEQ ID NO:4.
- 3-4. (Canceled)
5. (Currently amended) A host cell transformed or transfected ~~to contain~~ with the recombinant DNA molecule of claim 1.
6. (Currently amended) A host cell transformed or transfected ~~to contain~~ with the recombinant DNA molecule of claim 17.
7. (Currently amended) The transformed or transfected host cell of claim 6, wherein the chelon protein ~~which~~ comprises the amino sequence given in amino acids 1 to 107 of SEQ ID NO:4.

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8. (Canceled)
9. (Currently amended) A method for recombinantly producing a chelon protein in a host cell, said method comprising the steps of:
- a) ~~infecting or~~ transforming a host cell capable of expressing a chelon protein coding sequence with a vector comprising a promoter active in said host cell operably linked to a coding region for said chelon comprising an amino acid sequence as selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10, amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12 to produce a recombinant host cell; and
 - b) culturing the recombinant host cell under conditions wherein said chelon is expressed.
10. (Currently amended, withdrawn) A method for removing divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations from a source comprising said cations, said methods comprising the step of contacting the source with a ~~MerR or~~ chelon protein, wherein the chelon protein has an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9; amino acids 1 to 107 of SEQ ID NO:10; amino acids 1 to 107 of SEQ ID NO:11; and amino acids 1 to 107 of SEQ ID NO:12, whereby the ~~MerR or~~ chelon protein binds the divalent mercury, divalent cadmium, cobalt, copper, lead, nickel or zinc cations.
11. (Canceled)

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12. (Currently amended, withdrawn) The method of claim 10 wherein the ~~MerR~~ or chelon protein is bound to a solid substrate and the source is an aqueous material.
13. (Currently amended, withdrawn) The method of claim 10 wherein the ~~MerR~~ or chelon protein is expressed in a transgenic plant cell, transgenic plant tissue or transgenic plant.
14. (Canceled)
15. (Currently amended, withdrawn) A chelon protein ~~having~~ comprising an amino acid sequence selected from the group consisting of amino acids 1 to 107 of SEQ ID NO:4, amino acids 1 to 107 of SEQ ID NO:5, amino acids 1 to ~~107~~ 108 of SEQ ID NO:6, amino acids 1 to 107 of SEQ ID NO:7, amino acids 1 to 107 of SEQ ID NO:8, amino acids 1 to 107 of SEQ ID NO:9, amino acids 1 to 107 of SEQ ID NO:10, amino acids 1 to 107 of SEQ ID NO:11 and amino acids 1 to 107 of SEQ ID NO:12.
16. (Withdrawn) The method of claim 12 wherein the chelon protein is bound to a solid support.
17. (New) The non-naturally occurring recombinant DNA molecule of claim 2 wherein the sequence is the nucleotide sequence of SEQ ID NO:3.